



Ø BEAT



COLO. SPRINGS,
COLORADO

SEPTEMBER 1981

VIDEO FOR SWL's

SLOW SCAN TV ON SHORTWAVE BROADCAST

For years, hams have been sending each other slow scan TV pictures (SSTV). Now broadcasting stations are experimenting with SSTV transmission.

While ordinary (fast-scan) TV requires a bandwidth of several megahertz, that of SSTV is no more than an ordinary SSB signal so it can be sent on existing shortwave facilities, whether amateur or broadcast. The price paid for this narrow bandwidth is reduced definition (clarity) and a great increase in the time it takes to send one single frame. It takes eight seconds, in fact, which means that motion cannot be conveyed so a more appropriate name might have been "fast scan facsimile."

Nevertheless, the prospect of being able to see still pictures from shortwave broadcast stations is intriguing. During certain programs (the news, for instance) stations with more than one frequency in use could send voice on one and accompanying slides on the other. A small investment in amateur SSTV equipment would be necessary, but transmitters would not need to be modified. However SSB provides better results on SSTV than does AM.

The major obstacle at this point is the lack of SSTV equipment among short wave listeners, which is not surprising since there are no regularly scheduled SSTV broadcasts! If some station took the plunge and began SSTV broadcasts on a regular basis, people would be encouraged to buy the equipment. If the latter were receive-only, it would cost considerably less than amateurs pay for two-way capability.

Already there are some non-amateurs who have SSTV receiving capability. One spur to this was the rapid retransmission by SSTV of pictures received from the Voyager mission, thanks to ham station W6VIO at Jet Propulsion Laboratory.

Within the past few months both Israel Radio and Sweden Radio have carried out experimental SSTV transmissions and more are expected. The inventor of SSTV, Cop MacDonald, VE1BFL, prepared a test on Radio Sweden and received pictures in Prince Edward Island from Sweden.

from Popular Electronics

Frank WBØPAJ

LETTERS RECEIVED

Biz Wichy WDØHCO, who was our club PR Chairman until he decided to take a job on Kwajalein Island writes that things are pretty boring down there, but that if you would like to work a KX6 contact, they will be on the air 0700-1000 GMT Friday and Saturday nights, 14.310-14.340. He says to follow the pileup to Kwajalein. Biz is also looking to buy a used 100 watt AM ham transmitter to be converted to broadcast frequencies. They have gotten permission to set up a broadcasting station. He suggests a Heath DX or Johnson Viking series. His address: Biz Wichy KX6QT, Box 437, APO San Francisco, CA 96555. He says that there's no radio, TV, or girls — so get on the air and give Biz something to do.

P.P.R.A.A. DIRECTORS

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Board Member	*Al Bailey ADØZ 2715 Alteza Ln. 80917	597-8514

(* Two-year board terms began October 1980)

ZERO BEAT is published monthly in the interest of the members of the Pikes Peak Radio Amateur Association, Inc., Colorado Springs, Colorado. Permission is given to reprint articles or excerpts provided credit is given. Deadline for submission of articles is the 21st of the month. Classifieds accepted anytime.

The Pikes Peak Radio Amateur Association meets on the second Wednesday of every month at the First United Methodist Church, 420 N. Nevada, at 7:30 p.m. All amateurs and interested parties are invited to attend.

Editor: Don Lohse KBØKQ, 1410 E. LaSalle, Colorado Springs, CO 80907 635-7469

AUGUST MEETING MINUTES

The August meeting of the PPRAA was called to order by President Dave Vierling NØDV at 7:37 on August 12.

A ham moving into town had asked about antenna restrictions in various parts of the city, and a sheet was passed around for members to write down any restrictions they knew of.

NØDV reported that he had been contacted by a disabled ex-ham who wanted to get back into things, and asked if there were any people interested in helping, volunteers did stand up.

A new RFI complaint was called into NØDV, and was referred to Greg Utterback KAØFOZ, Interference Committee Chairman.

The possibility of the Club buying the main dish for the picnic was brought up, but after discussion, a vote by the membership was not in favor of this.

Bud Libengood, our CCARC delegate gave a report on the last meeting of CCARC, and their response to the letter sent them by our club concerning the direction of the council. They said the letter raised some valid questions and an answer would be forthcoming in a couple of weeks.

The program featuring Rocky Mountain Division ARRL Director, Vice-Director and ARRL Vice President (Lys Carey, Marshall Quilat and Carl Smith respectively) proceeded with some lively discussion and questions being asked. Some points were raised that will hopefully find their way into discussion at the next Directors of the ARRL meeting.

After refreshments, Dave NØDV announced that we have signed with the First United Methodist church an agreement to use that building for our meetings at least through December, when we will hopefully extend the agreement. So note that we will not be meeting at Sabin this year.

The Meeting was adjourned at 9:58.

Respectfully Submitted,
KBØKQ (for KFØW)

PPRAA CLASSES

Novice classes for the Fall will begin on September 15, 1981 at 7:00 p.m. at North Junior High. CW will be on Tuesday nights and be taught by NØDV. Theory will be taught by KBØKQ on Thursday nights. If you know anyone interested in getting a ticket, please pass along this information. Look for notices of the class posted in the various electronics emporiums around town. Always, classes are free.

SORRY ABOUT THAT, AL


Due to an oversight, (too many pieces of paper) a byline was left off the Circuit Board article in last month's Zero Beat. Our thanks to Al Bailey ADØZ for his fine article. An oversight like this is regrettable, since those people who write articles for Zero Beat certainly deserve recognition and appreciation. Thanks again Al!

Typesetting courtesy The Letter Setters

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AUGUST BOARD MINUTES

The board meeting was held at 7:30 PM at the home of Dave Vierling, 2511 N. Tejon. Those present were Dave, NØDV; Les, WDØGTA; Doug, WBØMHP; Ray, AAØL; Don, KBØKQ; Al, ADØZ; Bud, KAØLBP; and Charleen, WBØYOB.

The first item of business was to consider a public service request for communications for a walk-a-thon to be held August 29. Due to the fact the event was politically oriented the board felt the club should not furnish communications in the name of the club. However, if individuals wish to assist, that would be their choice. This brought further suggestions for the guidelines being established by the Public Service Committee.

The Woodland Park Enduro will not furnish breakfast this year so those helping on this event will not have to rise and shine quite so early. The Enduro is scheduled for September 20.

October 17 will be Band Day at the Air Force Academy and NØBOB and NØBNX will need 5 or 6 people to coordinate bus arrivals.

The club picnic is September 13 at the Black Forest Recreation Area. The club will furnish beverages, chips, and charcoal with grill, but the board decided it would be impossible to furnish the meat for everyone. So — bring your own meat and whatever you want to go with potato chips and beverages.

Suggestions were made for nominations for officers and board members for next year. Board members will be contacting these people for acceptance of the nomination. If club members wish to run for office or know someone who does, let a board member know. The person nominated must accept, be present the night of the election (October meeting), or submit his acceptance in writing.

Bud Liebgood gave a report of the CCARC meeting in Glenwood Springs. There is a committee preparing a statement of purpose and other information concerning CCARC to be given to clubs for future reference. The next meeting of CCARC will be here in Colorado Springs on October 24. The Board to give Bud funds for refreshments and proper arrangements for the meeting. Since we are the host club we urge all members to attend.

A copy of club members' names and calls for each new member was proposed. The Board felt this would be a good idea. Doug will check into getting a computer print out list made.

Novice classes are being set up and flyers will soon be out with dates and times. The classes will be at North Junior High in conjunction with Community Schools on Tuesday and Thursday evenings.

The next Board Meeting will be at Don Lohse's home, 1410 E. LaSalle, at 7:30 PM on September 14, 1981.

There being no further business the meeting was adjourned. Dave and Barb furnished us with delicious pie and coffee to keep our brains functioning — thanks, it was great!

Respectfully submitted,
Charleen, WBØYOB

CLUB PICNIC

Don't forget the club picnic on September 13, from 10 to 6 at the Black Forest Recreation Area on Shoup Road. Club will provide liquid refreshments, charcoal and chips. Bring what else you might need to make it a great time. See you there!

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MAXWELL ANTENNA

While a conventional dipole antenna has been a convenient evolutionary reference for the relative performance of beams, it would appear that its efficiency in producing long ranging radio waves is considerably less than thought. This would seem due to its production of electric fields far in excess of the Maxwellian theory, and the loss of this surplus electric field, probably within the "inductive field range of a few wave lengths." Most dipoles radiate a wave averaging in excess of 1,000 ohms impedance, whereas Maxwell predicted equal electric and magnetic fields, or an impedance of an ohm.

Since a new stub antenna radiates practically all of its energy at or near the Maxwellian impedance, it is called a Maxwell Antenna. A rather rigorous testing program has shown it to be omnidirectionally as strong as usual tri and monoband HF commercial Yagi beams are in their low angle favored direction, or about 6db over a dipole. In total radiation it is nearly 10db over a dipole, since its pattern is almost spherical. It is also a relatively noise and signal angle phase nulling free receiving antenna.

Both the new 20 meter antenna and seven existing station Yagi beams were tested at various heights and locations, so that they could be graphically compared on an equivalent height and power basis to a well equipped monitor station, averaging some 24 miles distant and 6,000 ft. higher. The vertical and horizontal monitor antenna averaged results for each test are shown in Fig. 1. In another comparison it was equal to a 2 element Quad, with both antennas on reasonably adjacent 80 ft. towers, and working mutual DX contacts.

Numerous rotation tests of this type of antenna on both 2 and 20 meters have shown that there is negligible buck-boost radiation from the line portion, and hence its radiation is essentially from the very low impedance shorting-bar portion. In another test of shorting-bar activity, a 2 meter version's 4 inch long shorting bar

length was within the focal spot of a 6 ft. parabolic dish, which then provided some 8db forward gain.

Since it is such an effective radiator, the impedance of the shorting-bar must approximate the impedance of the long ranging wave in space. The 2 meter antenna inch shorting-bar's impedance was determined by feeding the antenna with various impedance sources, such as 200, 50, 12.5, 3.1 and 0.5 ohms, finding the match points by cut and try, and plotting their distances from the shorting-bar vs the supply impedances, as shown in Table 1.

There is some choice in where to reference the foregoing measurements. If it is to the shorting-bar centerline, the extrapolated impedance is about 0.2 ohm, and this times 4 is about one ohm for the whole shorting-bar width. If the measurement is to the near side of the bar it is 0.5 ohm to one side, or 2 ohms across the whole width, neglecting in both cases the impedance of the connecting wire.

The 24 inch long shorting-bar of the 20 meter antenna constructed of 4 inch aluminum pipe was found to have somewhat higher impedance when tested in the same manner, but the essential characteristics of pattern and strength remained. Even if the full shorting-bar impedance were as much as 50 ohms, this would still be very "Maxwellian", as compared to initially radiated dipole waves, which average into the thousands of ohms.

As shown in Fig. 3, the new stub antenna is highly successful in preventing the radiation of the high impedance fields, and so conserves that energy for driving the Maxwell impedance approximately shorting-bar. A Yagi or Quad's parasitic elements, significantly driven by the closeness of the main element's electric fields, and through their resonance converts some of that electric field energy to

(continued from page 5)

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MAXWELL (cont.)

contributing phased magnetic field. The stub antenna's conversion to Maxwellian wave conditions appears to be significantly more complete, and there are no nulls off the ends of the shorting-bar.

It would seem that Hertz (and we) have not been as Maxwellian as thought, and that this makes an important difference.

© D. Gieskieng, 27 June 81

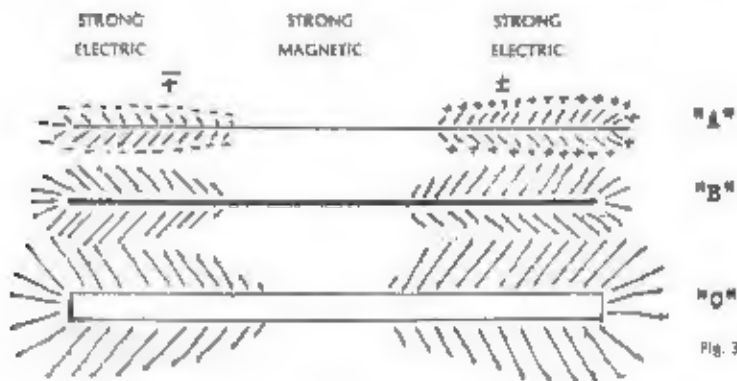


Fig. 3

Electric field radiation and loss vs. conductor diameter, increasing in dipoles "A" "B" and "C", but conserved in "D" stub arrangement.

MAXWELL

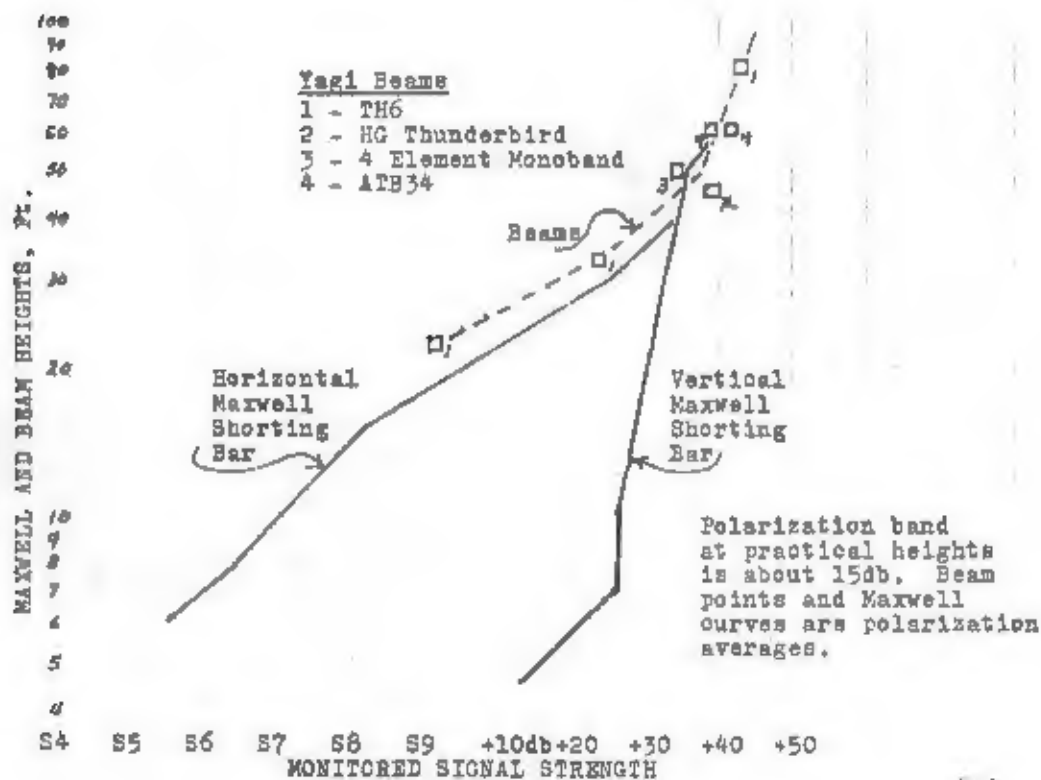
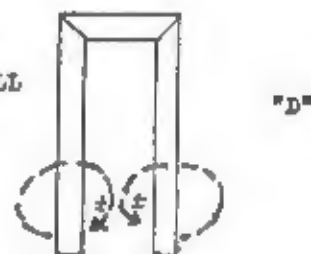


Fig. 1

TABLE 1

This table represents the distance from shorting bar to feedpoint (in centimeters) of the Maxwell antenna, and resulting feed impedances.

0	.5 ohms
1	3 ohms
2	10 ohms
3	40 ohms
4	110 ohms
4.3	200 ohms

MEETING NOTICE

The September meeting of the Pikes Peak Radio Amateur Association will be held on September 9, 1981 at 7:30 p.m. in Room 7 (in the basement) of the First United Methodist Church, located on the corner of Nevada and Boulder. The program will be on causes and cures of RFI and will be given by Greg Utterback, club Interference Committee Chairman. Bring questions and problems you may have had. All members and interested guests are invited to attend.

NOTE: Articles concerning technical information are printed in Zero Beat for the consideration of readers. Zero Beat does not vouch for the accuracy of data and conclusions drawn.

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